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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/053,646 | 01/24/2002 | Jeff Thornton | 000515-237 | 3600 |

7590 03/03/2004

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| EXAMINER | |
|---|---|
| LEE, RIP A | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1713 | |

DATE MAILED: 03/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

mk

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/053,646 | THORNTON ET AL. | |
| | Examiner | Art Unit | |
| | Rip A. Lee | 1713 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *21-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-39 and 43-45* is/are rejected.

7)☒ Claim(s) *21-26, 29, 35 and 38-44* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01-24-2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1. Claims 21 is objected to because of the following informalities: The claim uses the term "hydrophobic nitroxyl radical" and the phrase "nitroxyl radicals are hydrophobic" incorrectly. Apparently, the recitations are meant to impress the fact that hydrophobic interactions are operative in the separation step. However, describing nitroxyl radicals as being hydrophobic is out of context, expecially in view of the fact that TEMPO is water soluble. Appropriate correction is required.

2. Claims 23, 26, 38, 39, 43, and 44 are objected to because of the following informalities: The claims make incorrect use of the term "hydrophobic nitroxyl radical" (see previous paragraph). Appropriate correction is required.

3. Claim 24 is objected to because of the following informalities: It is not clear what is meant by the term "hydrophobic synthetic resin." Appropriate correction is required.

4. Claim 25 is objected to because of the following informalities: Trademarks XAD-2, *etc.*, are not permitted in the claims. Appropriate correction is required.

5. Claims 29 and 35 are objected to because of the following informalities: Both claims recite the relative term "high vapor pressure." It is not clear what constitutes a high vapor pressure. Appropriate correction is required.

6. Claim 42 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim is drawn to a process of selective oxidation of primary alcohols. It is unclear how this pertains to or limits the claimed process of separation of nitroxyl radicals.

7. Claim 43 is objected to because of the following informalities: It is not clear what is meant by the term "continuous manner." Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 23, 31, and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims use the term "further comprising," implying that the claimed process involves previous steps for separation of nitroxyl radicals. According to the specification, the claims are drawn to the operative feature of the invention. No steps relevant to the actual process of separation of nitroxyl radical is involved, thereby making the term "further comprising" unwarranted.

10. Claim 37 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear from the claim language what is being precipitated. Does the precipitated feature of the claims encompass the hydrophobic interaction of interest, or is it independent of the hydrophobic interaction? Without further qualification, the claim remains vague and indefinite.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 21, 22, 39, and 43-45 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 96/36621 to Heeres *et al.*

Heeres *et al.* describes a process in which TEMPO is extracted from aqueous solution with diethyl ether in Example 1, page 9. As can be seen in Example 3, the recovered TEMPO can be recycled continuously without losses in catalytic activity.

13. Claims 21-30 and 43-45 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,335,464 to Ochi *et al.*

The prior art of Ochi *et al.* discloses a process in which TEMPO is separated adsorptively from aqueous reaction mixture by addition of synthetic resins (see examples). Amberlite resin XAD-2 is mentioned in Example 3. Example 5 shows that synthetic resins having TEMPO adsorbed thereon can be reused continually. These resins may be used as a stationary phase for chromatographic purposes (see Referential examples, cols. 10-11, and col. 6, lines 57-64). The amine oxide may be desorbed and recovered from the resin using water-miscible sovents such as THF, acetone, or lower alcohols (col. 7, lines 37-44).

***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. Claims 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,335,464 to Ochi *et al.* in view of U.S. Patent No. 6,448,627 to Anggard *et al.*

The discussion of the disclosures of the prior art of Ochi *et al.* from paragraph 13 of this office action is incorporated here by reference. The inventors do not teach the use of silica gel as the adsorptive medium. However, in view of the fact that the invention relies on chromatographic techniques, one having ordinary skill in the art would have contemplated use of silica as a carrier. The skilled artisan would learn from Anggard *et al.* that TEMPO derivatives may be chromatographed, that is, adsorbed and desorbed, through silica without decomposition. Therefore, it would have been obvious to one having ordinary skill in the art to use silica in place of synthetic resins described in Ochi *et al.*, and the skilled artisan would have expected such an embodiment to work equally well. The skilled artisan also would have found it obvious to use conventional solvents recited in the claims because they are disclosed in the references.

***Allowable Subject Matter***

17. Claims 40 and 41 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The routineer in the art would not have found it obvious to select higher alcohols such as 1-octanol from a host of readily available solvents.

18. The subject matter of claim 38 would be allowable upon appropriate amendment to overcome the rejection under 35 U.S.C. 112, second paragraph and if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the cited references teaches or suggests use of cyclodextrin for separating nitroxyl radicals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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February 24, 2004

DAVID W. WU
SUPERVISORY PATENT EXAMINER
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